

The Development of High Efficiency Production Method with Modulated Operation Including Dissolution in Salt Crystallization

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Summary

Introduction High suspension conditions are required for the improvement in production efficiency of salt crystallization. However, under such conditions, a secondary nucleation rate becomes high and crystal size distribution (CSD) becomes broad. On the other hand, it was reported that in the case of solvent addition as "dissolution water", the number of micro-crystals decreases and CSD is improved. However, the influence of the modulation operation containing an undersaturation operation on the crystal purity is not discussed. In this research, the effects of the modulation operation on CSD and the amount of inclusion were discussed.

Results and Discussion Dissolution water was added on different conditions (Table 1), CSD and the water content as the amount of inclusion of product crystals were discussed. Under the blank conditions which do not add dissolution water, *CV* value was about 80%. On the other hand, *CV* value has improved to about 30% by addition of dissolution water. The effect was not based on conditions but was almost similar. However, as shown in Fig. 1, there was a difference in the amount of inclusion by the addition method of dissolution water.

Conclusion It was confirmed that addition of dissolution water is related to inclusion formation. However, the addition method of dissolution water influences the amount of inclusion. Therefore, in the case of addition of dissolution water, it is important to set up the conditions in consideration of both particle size distribution and the amount of inclusion.

Table 1 Experimental conditions

Run#	Number of injection	Interval [min]	Volume of dissolution water [mL]
1	12	20	8
2	6	40	8
3	12	20	4
Blank	0	-	-

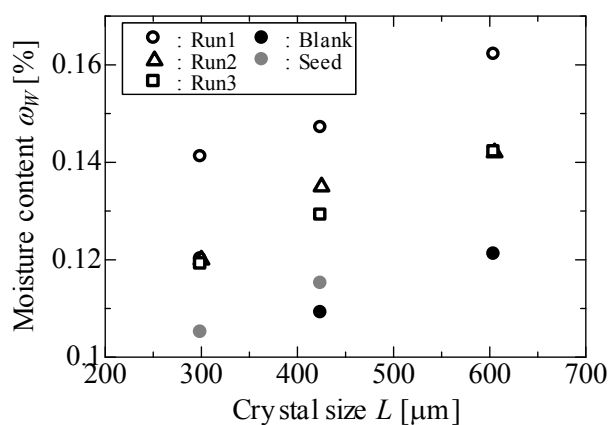


Fig. 1. Relationships between water content and size